BRILL

Insect Systematics & Evolution 41 (2010) 275–294

brill.nl/ise

A new genus and three new species of Oriental Oxycerini (Diptera: Stratiomyidae: Stratiomyinae) with notes on new generic synonyms in two other stratiomyine genera

Rudolf Rozkošný[a,*] and Norman E. Woodley[b]

[a]Department of Botany and Zoology, Faculty of Sciences, Masaryk University, Kotlářská 2, 61137 Brno, Czech Republic

[b]Systematic Entomology Laboratory, PSI, ARS, USDA, c/o Smithsonian Institution NHB-168, P.O. Box 37012, Washington, DC 20013-7012, USA

*Corresponding author e-mail: rozk@sci.muni.cz

Abstract

Oxycerina gen.n. (Stratiomyidae: Stratiomyinae), including three new species, *O. hauseri* sp.n., *O. merzi* sp.n. and *O. sabaha* sp.n., is described from the Oriental Region and compared with related genera of Stratiomyinae and Raphiocerinae. The monotypic genus *Scapanocnema* Enderlein, 1914 is considered to be a synonym of *Odontomyia* Meigen, 1803; *S. spathulipes* Enderlein, 1914 and *O. latitibia* Rozkošný & Kovac, 1994 are considered to be new synonyms of *O. luteiceps* de Meijere, 1911. *Cyrtopus* Bigot, 1883, is also proposed as a synonym of *Odontomyia*, resulting in new or resurrected combinations for the species *O. fastuosa* (Bigot, 1883), *O. magnifica* Lachaise & Lindner, 1973, and *O. smaragdifera* (Lindner, 1938). *Timorimyia* Frey, 1934 is proposed as a new synonym of *Acanthasargus* White, 1914, resulting in *A. bidentatus* (Frey, 1934), comb.n. A key to the genera of the Oriental Stratiomyinae and Raphiocerinae is presented.

Keywords

Oxycerina gen.n., *O. hauseri* sp.n., *O. merzi* sp.n., *O. sabaha* sp.n., new synonyms, Thailand, Malaysia

Introduction

Monophyly of the three tribes of Stratiomyinae recognized by Woodley (2001) (Oxycerini, Prosopochrysini, and Stratiomyini) and their interrelationships, have not been studied rigorously using cladistic methods. *Oxycerina* gen.n., is described herein, and placed within Stratiomyinae based on the antenna having six flagellomeres and its general resemblance to members of the tribe Oxycerini. It can be assigned to this tribe by its lack of crossvein m-cu, although this character state may be plesiomorphic. Crossvein m-cu is present in Prosopochrysini and Stratiomyini. These groups were

DOI 10.1163/187631210X502833

found to be monophyletic in a molecular study of stratiomyid subfamilies (Brammer & von Dolen 2007) but only a few exemplar taxa were studied in that work. The results of their study indicated support for two tribes within Stratiomyinae: the Stratiomyini as recognized by Woodley (2001) and another tribe that consists of Oxycerini+ Prosopochrysini+Raphiocerinae. We present the taxonomic results of this study using the current classification, which recognizes three tribes in Stratiomyinae and the subfamily Raphiocerinae as a higher taxon within Stratiomyidae. However, we realize that changes in this higher classification may be warranted if further studies corroborate the results of Brammer & von Dolen (2007).

The Oriental fauna of Stratiomyinae and Raphiocerinae includes 12 genera that are insufficiently known.

After reviewing the Oriental genera of Stratiomyinae, including Raphiocerinae, we found that *Cyrtopus* Bigot, 1883 and *Scapanocnema* Enderlein, 1914 are new synonyms of *Odontomyia* Meigen, 1803 while *Timorimyia* Frey, 1934 is a synonym of *Acanthasargus* White, 1914.

Gongroneurina Enderlein, 1914 and *Rhaphioceroides* Brunetti, 1927 are very probably endemic to the Oriental Region, whereas *Prosopochrysa* de Meijere, 1907 also occurs in the Palaearctic Region. *Afrodontomyia* James, 1940 is apparently of Afrotropical origin, *Acanthasargus* is also found in the Australian Region, *Oplodontha* Rondani, 1863 ranges over the Old World except for Australia, and *Odontomyia* is worldwide. *Oxycera* Meigen, 1803 is absent only from the Neotropical and Australian Regions whereas *Nothomyia* Loew, 1869 also occurs in the Americas and Australia, *Stratiomys* Geoffroy, 1762 is absent only from Australia.

Three new species of *Oxycerina*, gen.n. are described herein from specimens collected in East Malaysia and Thailand. A key to Oriental genera of Stratiomyinae and Raphiocerinae, as well as one to species of *Oxycerina* gen.n. is presented.

Materials and methods

The examined material is deposited at the following institutions: Muséum d´Histoire Naturelle, Geneva, Switzerland (MHNG); Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland (PAN); Nationaal Natuurhistorisch Museum – Naturalis, Leiden, The Netherlands (RMNH); Naturhistorisches Museum, Basel, Switzerland (NMB); Department of Entomology, Smithsonian Institution, Washington, DC, USA (USNM), Zoological Institute of the Slovak Academy of Sciences, Bratislava, Slovakia (ZIB) and Zoologisch Museum, Instituut voor Taxonomische Zoologie, Universiteit van Amsterdam, Amsterdam, The Netherlands (ZMAN). The body length reported for specimens excludes the antennae and the head is measured without antennae but including the ocellar tubercle. The length of the female frons is given from the base of the antennae to the anterior ocellus and the width is measured at the midpoint of the frons length. The length of wing is measured from the proximal margin of the basicosta to the level of the wing apex. Morphological terminology follows Papp & Darvas (2000).

Taxonomy

Key to Oriental genera of Stratiomyinae and Raphiocerinae

1. Antennal flagellum composed of 7–8 flagellomeres, gradually attenuated apically, the apical flagellomere about as long as preceding five flagellomeres combined; hind tibia modified, abruptly thickened in medial third……
……*Rhaphioceroides* Brunetti
Note: The species that Brunetti (1927) described as the type species of Rhaphioceroides from Thailand was said to have 8 antennal flagellomeres; two specimens (USNM) we examined from India, probably a different species, have 7.
Antennal flagellum composed of 5–6 flagellomeres, form various but not gradually attenuated apically; hind tibia not abruptly thickened in medial third.....2

2. Apical antennal flagellomere modified into a slender arista or arista-like style that is at least as long as the preceding two flagellomeres (some *Oxycera*), usually much longer than the remaining flagellomeres combined……..……..……..….3
Apical antennal flagellomere not markedly different from preceding flagellomeres, may be short and slightly modified but not arista-like.....6

3. Apical part of vein CuA_1 originating from discal cell (i.e., no crossvein dm-cu present; abdomen about as long as wide or wider than long.……
…….....*Oxycera* Meigen
Apical part of vein CuA_1 originating separate discal cell, separated from it by crossvein dm-cu; abdomen distinctly longer than wide.....4

4. Body brownish to black, without metallic coloration, conspicuously marked with yellow on notopleural region, scutellum, and lateral margins of abdomen (Figs. 17-18)……..……..……..…*Acanthasargus* White
Body blackish with distinct greenish to bluish metallic coloration, not conspicuously marked with yellow.....5

5. Vein M_3 absent; scutellum without spines.....*Prosopochrysa* de Meijere
Vein M_3 present; scutellum with an obvious pair of marginal spines.....
.....*Nothomyia* Loew
Note: The tribe Prosopochrysini has not been studied on a worldwide level so the generic concepts in the group remain vague. For instance, some Neotropical members of *Nothomyia* have very reduced scutellar spines and vein M_3 reduced or absent. Thus, couplet 5 will work for Oriental species but not for species from other regions.

6. All antennal flagellomeres with dense, erect setae; sixth flagellomere distinctly longer than any others, usually about twice as long as 4+5 combined……
.....…..……*Oxycerina* gen.n.
Antennal flagellomeres without any dense, erect setae; sixth flagellomere at most subequal in length to flagellomere 4, usually much shorter or sometimes only five flagellomeres present.....7

7. Vein R_{2+3} absent, apparently fused with R_1; discal cell very small, fused with Rs (i.e., crossvein r-m absent); veins M_1, M_2, M_3 faintly developed to apparently absent beyond discal cell.....*Oplodontha* Rondani
   Vein R_{2+3} present; discal cell larger, not fused with Rs (i.e., crossvein r-m present); veins M_1, M_2, and M_3 usually all well developed, easily visible, but M_1 and sometimes M_3 abbreviated or nearly absent in *Odontomyia* spp.....8

8. Vein M_3 weak, distinctly fainter than M_2 or CuA_1, often entirely absent, M_1 also usually weak, especially in basal region near discal cell (Fig. 21)…….....
   .....*Odontomyia* Meigen
   Vein M_3 similar in development to M_2 and CuA_1, M_1 also strongly developed…….....……....9

9. Antennal flagellomeres 5 and 6 distinctly visible and separated from basal four flagellomeres, 6th forming a more or less distinct style usually held at an angle to rest of flagellum, as found in *Odontomyia*…….....*Afrodontomyia* James
   Note: This genus is poorly known, and it is not certain that the Oriental species are congeneric with those from the Afrotropical Region, where the type species occurs.
   Antennal flagellomeres 5 and 6 not distinctly separated from basal four flagellomeres, 6th not forming a more or less distinct style, and sometimes absent....
   ……..…….....10

10. Scape at most two-times length of pedicel; 6th flagellomere clearly evident; head and abdomen black, not marked with yellow……
    ……..……*Gongroneurina* Enderlein
    Scape more than two times, and usually 3–5 times, length of pedicel; usually only five flagellomeres present, although there are occasionally 6; head and/or abdomen marked with yellow……...……*Stratiomys* Geoffroy

Oxycerina gen.n.

Type species
Oxycerina sabaha sp.n., by present designation.

Diagnosis

Presence of relatively long, stiff setae on all six antennal flagellomeres is autapomorphic. Also, the long pair of scutellar spines, each spine nearly twice as long as the scutellum, is probably autapomorphic, although long spines are known in some other Oxycerini (e.g., *Pachyptilum* Lindner, 1969, some *Euparyphus* Gerstaecker, 1857 and some *Oxycera* Meigen, 1803).

Description

Male. Eyes strongly holoptic, upper frons reduced to small triangle, lower frons and face not produced, evenly rounded in lateral view. Ocellar tubercle prominent.

Gena only slightly visible in lateral view, occiput not visible in lateral view. Eye essentially bare, with only a few extremely short, very sparse setulae visible at high magnification; ommatidia on upper two-thirds enlarged. Occiput developed posterior to eye-margin, postocular area visible only on ventral half of head. Antenna very slender, scape slightly longer than pedicel; flagellum composed of six unmodified flagellomeres, (ratio of flagellomeres in examined specimens, 1.0–1.3:1.0:1.0:1.2–1.9:2.3–2.8:4.1–4.5); all flagellomeres with long setae that are similar to those found on scape and pedicel. Palpi apparently absent.

Thorax unmodified, subscutellum weakly developed with short, sparse pilosity. Scutellum trapezoidal, disc slightly convex, with pair of apical spines that are about twice the length of scutellum or longer. Legs slender, simple, tarsi longer than tibiae. Wing with microtrichia over most of surface except some small bare areas near base; alula narrow and largely bare; cell r_1 short; vein R_{2+3} arising beyond well-developed r-m crossvein but proximal to apex of discal cell; cell r_{2+3} wide; costal vein extending slightly beyond apex of R_5; R_4 present; crossvein m-cu absent, veins M_1, M_2, M_3 and CuA_1 weakly developed from their origin at the discal cell and indistinct (M_2 the most distinct), largely indistinct from wing membrane; CuA_1 straight; A_1 faint beyond base.

Abdomen slender, narrower than thorax in dorsal view, gradually widening from base to segment 4. Male terminalia relatively small, close to the basic type of Oxycerini. Proctiger subtriangular and rather short, cerci oval, epandrium transverse, semicircular. Genital capsule subquadrate or slightly heart-shaped, gonostyli short and turned inwards, narrowed apically, distal medial process distinct or absent, gonocoxal apodemes reaching beyond proximal margin of genital capsule. Aedeagal complex tripartite, rounded or with almost straight margin proximally.

Female. Differs from male as follows: Head with eyes dichoptic, frons parallel-sided, rounded postocular area of head band-shaped, at upper eye angle longer than scape. Abdomen also elongate but more ovoid, broadest near midpoint of entire length. Female terminalia with one-segmented cerci and swollen proximal margin of epiproct. Genital furca subtriangular, with large median aperture, posterolateral appendages oval with proximal part elongate and rounded.

Etymology

The name indicates a relationship to the type genus of Oxycerini, *Oxycera* Meigen. The gender is feminine.

Remarks

Oxycerina gen.n. has a few character states that are more commonly seen in the Prosopochrysini. We discuss a few observations on characters below with respect to the state observed for *Oxycerina* gen.n.

Antennal flagellum not modified apically. In most Oxycerini the apical flagellomeres are not strongly narrowed, except in the genus *Oxycera* which includes many species having the last flagellomere aristiform. In Prosopochrysini, most taxa have the apical

flagellomeres modified, with the last flagellomere often aristiform. There are some genera of Prosopochrysini, however, such as *Myxosargus* Brauer, 1882, in which the antennal flagellum is not highly modified or narrowed apically.

Wing cell r_1 ("stigma") short. Virtually all Oxycerini examined have a short cell r_1. The distal edge of the cell is formed by vein R_{2+3}, which arises proximal to the distal margin of the discal cell. The only exception we have confirmed is a single Neotropical species of *Euparyphus* Gerstaecker, 1857. Most Prosopochrysini have cell r_1 more elongate, with vein R_{2+3} arising distal to the apex of the discal cell, although some species of *Myxosargus* are exceptions.

Wing cell r_{2+3} elongate, relatively wide. This character state is found in virtually all Prosopochrysini, but not in Oxycerini other than *Oxycerina* gen.n. Most Oxycerini have a narrower and shorter cell r_{2+3}, sometimes very short such as in *Euparyphus* (subgenus *Aochletus* Osten Sacken, 1886).

Wing with veins M_1, M_2, M_3 and CuA_1 faint distal to discal cell. This character state is found in some Oxycerini, such as *Vanoyia* Villeneuve, 1908, and some species of *Euparyphus* (especially in the subgenus *Aochletus*) and some *Caloparyphus* James, 1939. This character state, with the veins noted being more or less uniformly faint, has not been observed in Prosopochrysini. In some cases, such as in some species of *Prosopochrysa* de Meijere, 1907 and *Nothomyia*, vein M_3 can be faint or absent, but the other veins are more strongly developed.

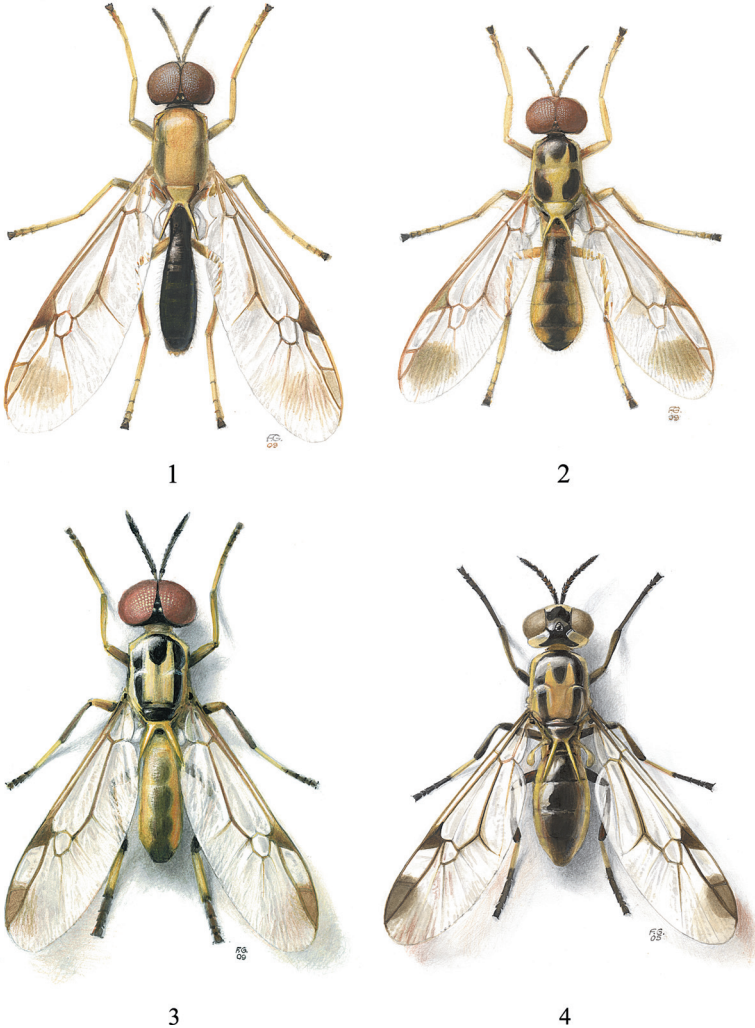
The phylogenetic relationships among genera of Oxycerini have never been studied. *Oxycerina* gen.n. exhibits one presumably plesiomorphic character state within the tribe, a trifid phallic complex. Some genera of Oxycerini, such as *Euparyphus* and *Glariopsis* Lindner, 1935, have a bifid phallic complex which is presumably synapomorphic for that group although it is known in a few species of *Oxycera* as well. Also, a one-segmented female cercus is undoubtedly a derived character state that is found in many *Oxycera* species but also in some other stratiomyid lineages (e.g., in the Nemotelinae).

Key to species of *Oxycerina* gen.n.

1. Hind femur and tibia yellow (Figs 1 and 2); scutellum yellow; thoracic pleura yellow, at most with diffuse brownish spots in middle of anepisternum and along upper margin of katepisternum……..……..……..…..……..2
- Hind femur and tibia black (Figs 3 and 4); scutellum usually mostly black (yellow in a few females examined); thoracic pleura with extensive black pattern (E Malaysia)……..……..…….. *O. sabaha* sp.n.
2. Wing cell r_{2+3} almost equal in length to cell r_4; scutum yellow with brownish, broadly separated longitudinal stripes between transverse suture and postalar callus (Fig. 1);

medial process of male genital capsule subconical (Fig. 6); ♀ unknown (E Malaysia) ..... *O. hauseri* sp.n.

- Wing cell r_{2+3} almost twice as long as cell r_4; scutum yellow with five black spots, three presutural spots fused anteriorly (Fig. 2); medial process of male genital capsule absent (Fig. 9); ♀ unknown (Thailand)..... *O. merzi* sp.n.



Figs 1–4. New species of *Oxycerina* gen.n.: *O. hauseri* sp.n., ♂, length 5.3 mm (1), *O. merzi* sp.n., ♂, length 4.4 mm (2), *O. sabaha* sp.n., ♂, length 5.8 mm (3), *O. sabaha* sp.n., ♀, length 6.8 mm (4). Orig. F. Gregor. This figure is published in colour in the online edition of this journal, that can be accessed *via* http://www.brill.nl/ise

Oxycerina hauseri sp.n. (Figs 1, 5–7)

Diagnosis

A species with predominantly yellow scutum and scutellum, yellow thoracic pleura with brownish spot in middle of anepistenum, hind femur and tibia also yellow. Vein R_{2+3} originating well beyond crossvein r-m and cell r_{2+3} thus almost equal in length to cell r_4; cell r_4 intensively infuscated. Hind leg predominantly yellow. Male genital capsule with well developed, subconical medial process.

Description

Male (Fig. 1). Body length 5.3 mm, wing length 5.5 mm.

Head transversely oval in dorsal view, 1.7-times as broad as long, much broader than anterior part of thorax, subglobular but flat posteriorly, only 1.2-times higher than long in lateral view, occiput slightly concave. Ocellar triangle longer than wide, distinctly prominent above level of eyes in lateral view, postocellar vertex narrow and somewhat swollen. Upper frons in front of anterior ocellus only narrow and tapering, barely as long as ocellar triangle. Upper frons yellow, ocellar triangle mainly shining black and vertex brownish. Large eyes covering greater part of head surface, contiguous at middle of frons for a relatively long distance being 1.5-times as long as ocellar triangle. Ommatidia on lower third of eye markedly smaller than upper ones. Triangular lower frons above insertions of antennae shining yellow, 1.5-times as broad as high. Antenna 1.3-times longer than head in profile, consisting of basal segments and six flagellomeres. Basal segments yellow, scape slender, twice as long as broad distally, pedicel subconical, shorter and somewhat swollen, about as long as broad distally. Three basal flagellomeres yellow, barely longer than broad, following flagellomeres darkened, more cylindrical and gradually elongated, last of them about 4-times as long as broad. All flagellomeres with short dark setae being dense especially on entire surface of flagellomeres 4-6. Face yellow and without oval brownish patch in middle but with small, narrow, shining brown medial triangle at upper oral margin.

Thorax yellowish brown in ground colour, dark pattern more brownish and much less extensive than in other known species. Narrow anterior margin of scutum and a pair of broadly separated diffuse longitudinal stripes brown, each stripe extending from suture to basal corners of scutellum (Fig. 1). Pronotum darkened, postpronotal callus and pleura pale yellow. Anepisternum with diffuse brownish spot in middle, katepisternum with similar but less distinct spot at upper margin. Scutellum pale yellow as is a large prescutellar area though lateral margin of scutellum with tapered brownish streak. Divergent scutellar spines pale yellow, each 1.9-times longer than scutellum at middle. Laterotergite, subscutellum and mediotegite shining dark brown, laterotergite with long, dense, erect, yellow hairs.

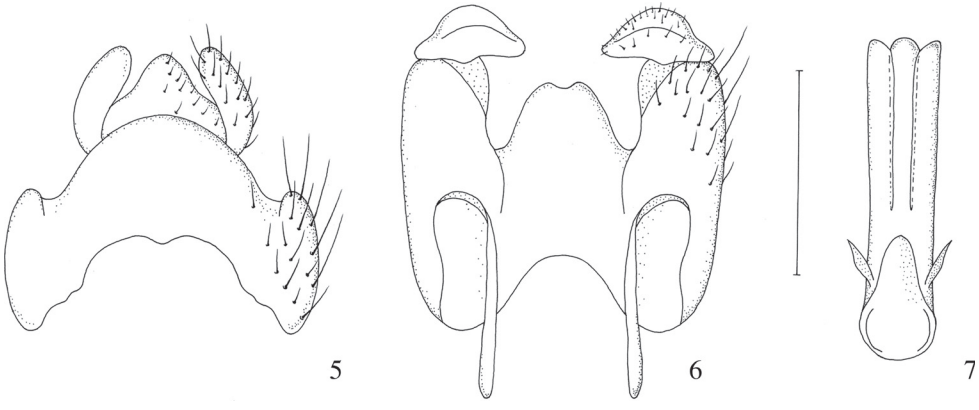
Wing with relatively strong veins, cell r_1 ("stigma") intensively brown and distinctly longer than in *O. merzi* sp.n. due to the origin of R_{2+3} beyond crossvein r-m at a distance twice as long as length of r-m. Costal section between R_{2+3} and R_4 only very

slightly longer than that between R_4 and R_5. Subapical dark spot of wing membrane more transverse, extending to entire cell r_4 and leaving a larger area of the wing apex almost hyaline. Rest of vein CuA_1 below discal cell somewhat more distinct, straight. Calypter pale brown, halter entirely yellow.

Legs mostly yellow, entire fore tarsus and last tarsomere of mid and hind legs brown.

Abdomen black dorsally and dark brown ventrally (Fig. 1), only narrow lines along posterior margins of sternites, visible margins of last two sternites, and male genitalia yellow.

Male terminalia (Figs 5–7): Epandrium broadly semicircular, with conspicuous lateral lobe on each side. Proctiger subtriangular, cerci oval, leafshaped, with long setae. Genital capsule subquadrate, distal medial process subconical, relatively high, gonocoxal apodemes long, reaching far beyond proximal margin of genital capsule. Gonostylus more elongate and less pointed apically. Aedeagal complex relatively long, with rounded proximal part.



Figs 5–7. *Oxycerina hauseri* sp.n., ♂ terminalia: proctiger, cerci and epandrium (5), genital capsule (6) and aedeagal complex (7). Scale 0.2 mm.

Female. Unknown.

Etymology

This species is named in honour of Dr. Martin Hauser, a reputable expert in basal Brachycera, who contributed significantly to the knowledge of the identity of this taxon.

Type material

Holotype, ♂, Malaysia, Sabah (Borneo), Batu Punggul Resort, primary forest, 24. vi.-1.vii.1996, F. Ciampor & J. Kodada leg., in ZIB.

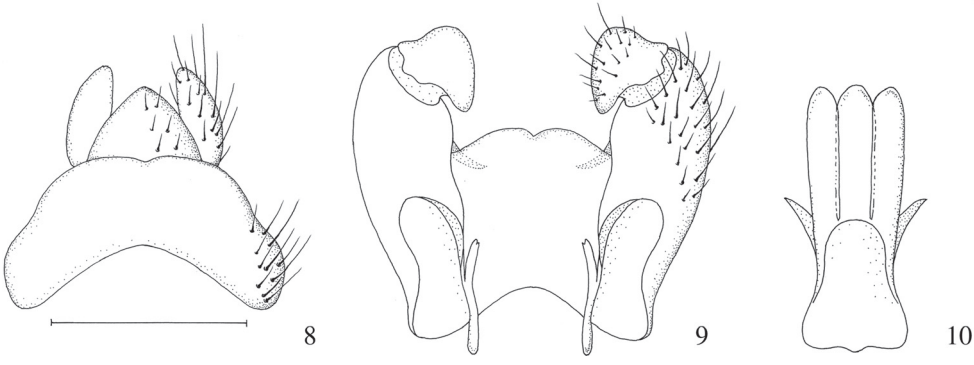
Distribution

Only the male holotype from Sabah in E Malaysia is known.

Oxycerina merzi sp.n. (Figs 2, 8–10)

Diagnosis

A species with extensive shining black pattern on the male scutum and uniformly yellow thoracic pleura and abdominal venter. Vein R_{2+3} originating close to crossvein r-m and cell r_{2+3} thus almost twice as long as cell r_4; cell r_4 only slightly infuscated. Hind leg predominantly yellow. Medial process of male genital capsule absent.



Figs 8–10. *Oxycerina merzi* sp.n., ♂ terminalia: proctiger, cerci and epandrium (8), genital capsule (9) and aedeagal complex (10). Scale 0.2 mm.

Description

Male (Fig. 2). Body length 4.4 mm, wing length 4.5 mm.
Antennae broken, only basal segments of left antenna remain. Both basal antennal segments yellow, pedicel as long as wide, scape slightly longer and more slender. Face shiny, predominantly yellow but with oval brownish patch at middle. Gena mainly horizontal, virtually invisible in lateral view. Lower postocellar area of head prominent and somewhat swollen, tapered toward middle of posterior eye margin. Gena and lower posterior area yellow. Proboscis also yellow, barely half as long as head in profile. Head pile chiefly short and fine, mainly yellow and inconspicuous. Some darker hairs visible beyond ocellar triangle and on basal antennal segments, longer, semi-erect to erect yellow hairs on face, proboscis and postocular area.

Thorax black and yellow. Presutural area of scutum nearly as long as broad, postsutural part distinctly broader. Ground colour of scutum yellow, extensive shining black pattern consisting of three broad and anteriorly merged longitudinal bands in

presutural area. Postsutural area with a pair of oblique and broadly separated black spots between suture and base of scutellum. Additional smaller black spot above wing base on each side. Scutellum including scutellar spines yellow. Spines long and slender, 1.8-times longer than scutellum at middle. Postpronotal callus, narrow notopleura and almost complete pleura shining yellow, only propleural area more brownish, laterotergite, subscutellum and mediotergite shining black. Thoracic pile mostly short, fine and yellow, not very dense; longer and erect only on prescutellar area and lower pleura. Longest and mainly dark hairs developed on laterotergite.

Wing hyaline, veins yellow to brown. Microtrichia covering greater part of wing membrane but reduced at wing base and alula. Vein R_{2+3} originating beyond crossvein r-m at a distance equaling length of r-m. Crossvein r-m well developed, as long as distal margin of discal cell. Costal section between R_{2+3} and R_4 almost twice as long as that between R_4 and R_5. Cell r_1 ("stigma") pale brown, subtriangular. A distinct, almost round, subapical dark spot present on wing membrane mainly below R_{4+5} and R_5, less distinct spot across distal half of cubital vein and base of discal cell. Only two M veins arising from discal cell but only basal part of M_1 distinct and M_2 only faint; also CuA_1 short and faint. Calypter small and yellow, with short brownish marginal hairs. Halter entirely yellow.

Legs including coxae yellow, but all tarsomeres of foreleg, last four tarsomeres of mid leg, three tarsomeres of hind leg and tip of hind tibia darkened.

Abdomen yellow, with extensive blackish dorsal pattern (Fig. 2). Venter entirely yellow. Abdominal pile predominantly yellow, fine and inconspicuous, longer erect hairs visible along lateral margins. Black parts covered with short, semi-erect, mainly black and dense hairs.

Male terminalia (Figs 8–10): Epandrium broadly semicircular, emarginate proximally, with only vague indication of lateral lobes, proctiger in shape of almost equilateral triangle, cerci relatively short, oval. Genital capsule broad, slightly heart-shaped, with somewhat diverging distal parts of gonocoxites and laterally protruding proximal corners. Medial process of genital capsule absent. Aedeagal complex relatively short, with nearly straight proximal margin.

Female. Unknown.

Etymology

The new species is named in honor of Dr. Bernhard Merz, the Swiss dipterist, who is respected as an expert in many families of Diptera and who collected the holotype in northern Thailand.

Type material

Holotype. ♂, North Thailand, 900 m, Chiang Mai Province, Doi Suthep-Pui N. P., What Phrathat, 18.80°N, 98.92°E, 16.x.2000, Schwendinger & Merz leg., in MHNG.

Distribution

Only the holotype from Chiang Mai Province in Thailand is known.

Oxycerina sabaha **sp.n. (Figs 3 and 4, 11–16)**

Diagnosis

A species with extensive black pattern on the scutum and thoracic pleura. Vein R_{2+3} originating well beyond crossvein r-m and cell r_{2+3}, thus, only slightly longer than cell r_4; cell r_4 intensively infuscated. Hind legs predominantly dark brown to black, only basitarsus except for distal fourth contrasting pale. Male genital capsule without medial process.

Description

Male (Fig. 3). Body length 4.9–5.5 mm, wing length 4.5–4.7 mm.

Head 1.7-times as broad as long in strictly dorsal view and about 1.5-times broader than anterior part of thorax, suboval, occiput distinctly concave. Ocellar triangle longer than broad, prominent above level of eyes in lateral view, postocular area narrow and somewhat swollen but visible in lateral view only in lower half of head. Narrow, subtriangular upper frons black as are ocellar triangle and vertex, lower frons above antennae in shape of equilateral triangle, yellow. Antennae about 1.6-times longer than head, brown, basal segments and three basal flagllomeres distinctly paler. Scape 2.5-times longer than broad distally, pedicel 1.5-times longer than broad, following 3 flagellomeres barely as long as broad, flagellomere 4 about 2.5-times longer than broad, flagellomere 5 about 2.5–3.0-times and flagellomere 6 about 5.0-times longer than broad. Flagellomeres 1–3 provided with short setae mainly along distal margin, remaining flagellomeres with fairly long and dense setae on entire surface. Face shining yellow, with a large, brown, suboblong and longitudinally oriented medial spot separated from insertions of antennae but reaching anterior part of oral margin. Gena yellow, broad and horizontal. Labellum of proboscis pale yellow. Head pile short and yellow, inconspicuous, black only on vertex and facial spot.

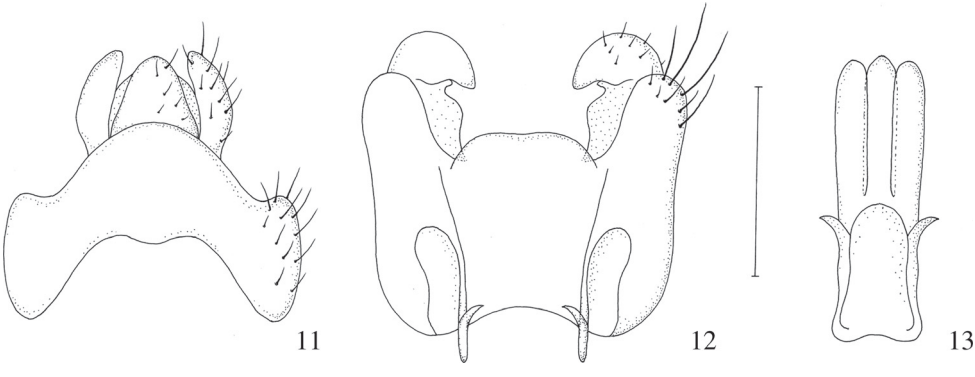
Thorax yellow in ground colour, about 1.4-times longer than broad (without scutellum). Scutum with conspicuous black pattern (Fig. 3): longitudinal stripes somewhat constricted at transverse suture, and narrowly connected just in front of proximal margin of scutellum. Large presutural median black spot tapered towards suture and broadly fused with lateral stripes anteriorly. Elongate and narrow black spot distinct also on each notopleura and broadened above wing base. Scutellum extensively black but its posterior margin and long spines yellow. Spines at least twice as long as scutellum at middle. Propleuron with a subtriangular black spot and anepisternum with a broad black band in middle touching notopleural spot above and completely shining black katepisternum below. Subscutellum and mediotegite dark brown to black, laterotergite predominantly or entirely yellow, with long, dense and erect yellow hairs.

Wing with intensively brown and distinctly long cell r_1 ("stigma"). Costal section between R_{2+3} and R_4 only slightly longer than that between R_4 and R_5. Apical darkening of wing membrane usually more extensive as in *O. hauseri* sp.n., extending beyond R_4 and usually not leaving wing apex hyaline. Calypter yellow to pale brown, with yellowish marginal fringe, halter completely pale yellow.

Legs extensively darkened, fore and mid femur broadly brown in basal half, fore tibia brown rather than yellow; fore tarsus chiefly blackish beginning from distal third of basitarsus. Both posterior pairs of legs predominantly black, only basitarsi contrastingly pale yellow, darkened only in apical sixth (mid basitarsus) or third (hind basitarsus).

Abdomen elongate and slightly clavate, yellow, with shining brown longitudinal medial stripe being distinctly constricted at boundary of segments 1–4 but dilated towards posterior margin of tergite 5. Venter yellow, only distal half of sternite 5 with brownish transverse band occupying more than middle third. Apex mainly pale yellow, only tergite 6 and cerci more brownish.

Male terminalia (Figs 11–13): Epandrium broadly semicircular, with conspicuous lateral lobe on each side. Proctiger and cerci as in other species. Genital capsule subquadrate, slightly tapered proximally, with straight posterior margin, without any medial process (Fig. 12), gonocoxal apodemes relatively short. Aedeagal complex short and rather broad with almost straight proximal margin.



Figs 11–13. *Oxycerina sabaha* sp.n., ♂ terminalia: proctiger, cerci and epandrium (11), genital capsule (12) and aedeagal complex (13). Scale 0.2 mm.

Female (Fig. 4). Body length 5.0–6.2 mm, wing length 5.1–6.0 mm.

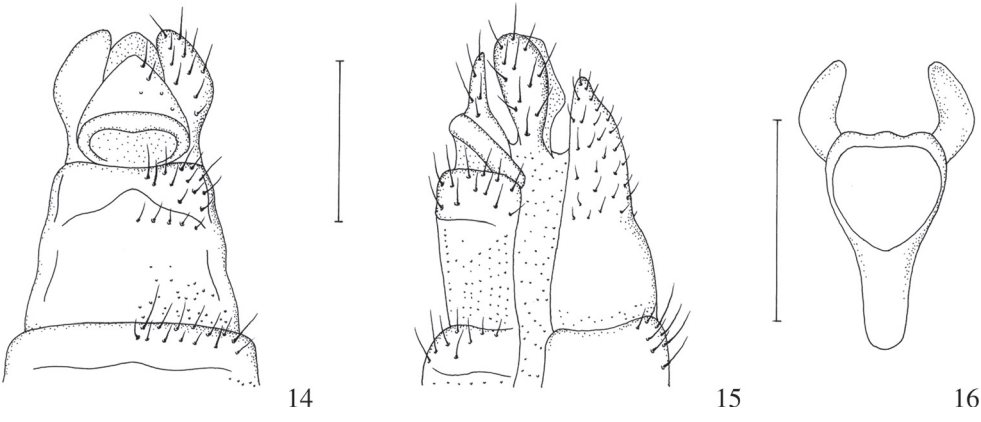
Head transverse, much broader than thorax, about 1.3–1.5-times as broad as long in dorsal view. Eyes separated by broad frontal band occupying middle third of head. Frons parallel-sided, only slightly broadened to bases of antennae, 1.3–1.4-times longer than broad. Postocular band at upper eye angle slightly broader than scape is long, tapering toward ventral margin of head. Eyes with uniform ommatidia. Antenna about 1.4-times as long as head, usually with somewhat longer scape than in male, almost

entirely dark brown to black, only base of scape, pedicel and two basal flagellomeres paler. Setae on flagellomeres even more distinct than in male. Ground colour of head yellow but upper half of occiput, vertex, ocellar triangle and upper half of frons shining black. Anterior margin of frontal spot with two subtriangular projections. Face with black median band from bases of antennae to anterior oral margin.

Thorax , wings and legs as in male but fore tibia often entirely brown and fore tarsus completely black. Scutellum usually mainly black as in male but in some females also entirely yellow.

Abdomen more spindle-shaped, usually distinctly longer than thorax (without scutellar spines), brown dorsally as well as ventrally though lateral margin of tergites diffuse yellowish though only narrowly on tergite 5. Apex beginning from segment 6 usually wholly pale yellow.

Female terminalia (Figs 14–16) with one-segmented cerci. Epiproct subtriangular, with prominent, distinctly swollen proximal border. Subgenital plate elongate, rounded apically. Genital furca with narrow frame, tongue-like proximal process, large median aperture and oval posterolateral appendages. Tergites 7 and 8 extensively reduced.



Figs 14–16. *Oxycerina sabaha* sp.n., ♀ terminalia: in dorsal (14) and lateral view (15), genital furca (16). Scales 0.5 mm.

Etymology

The specific name, a noun in apposition, is based on the name Sabah, a part of eastern Malaysia, where the type series was collected.

Remarks

The examined females exhibit distinct variability in the size and wing length; the extent of the frontal spot is variable and the darkened part of the fore femur may occupy the basal half or less. The fore tibia may be yellow or somewhat darkened on the distal half and the yellow margin of the abdomen varies in width. The longitudinal scutal stripes are usually transversely connected by a black band just above the scutellum but this

band may be partly or entirely reduced. The disc of the scutellum is regularly shining black in both sexes but in three females (from Danum Valley, 20.-22.xi.1987) it is wholly yellow although all other diagnostic characters agree with the other examined females of *O. sabaha* sp.n. In these females the black band in front of the scutellum is broad and easily visible.

Type material

Holotype. ♂, Malaysia, SE Sabah, nr. Danum Valley, Field C, WON 1, Mal. trap 5, 150 m, 23.viii.-13.xi.1987, van Achterberg & D. Kennedy, in RMNH.
Paratypes. 2 males and 16 females. Both males with the same locality label as the holotype but dates 13.ix.-4.x.1987 and 5.-26.x.1987. Females: 14 females with the same locality label as the holotype but with date 20.vi.-12.vii.1987 (1♀), 2.-23.VIII. 1987 (2♀), 13.ix.-4.x.1987 (2♀), 5.-26.x.1987 (1♀), 20.x.-22.xi.1987 (3♀: Malaise trap 14, on trunk W3; 2♀: Malaise trap 15, over rivelet; all C.v. Achterberg leg.); 20.-22. xi.1987, Malaise trap 4, over rivelet (1♀); 22.xi.-4.xii.1987 (1♀), 19.iii.-19.iv.1988 (1♀, C. v. Achterberg & T. Burghouts leg.), all in RMNH. Malaysia, Sabah, ca 25 km SE Sapulut, Batu Punggul env., Malaise trap, 23.v.2001, 2♀, F. Ciampor & J. Kodada leg., one in USNM and the second in ZIB.

Distribution

The type series was collected at two localities in Sabah, East Malaysia, on the island of Borneo.

Discussion

The following taxonomic changes, including two new generic synonymies, were elucidated during our studies of type material of various taxa described by earlier authors.

Genus *Acanthasargus* White

Acanthasargus White, 1914: 60. Type species, *Acanthasargus palustris* White, by monotypy.
Timorimyia Frey, 1934: 304. Type species, *Timorimyia bidentata* Frey, by original designation, syn. n.

Frey (1934) described *Timorimyia* from a single specimen collected on Timor in the Lesser Sunda Islands of Indonesia. He placed it in the subfamily Raphiocerinae based on similarities in wing venation and the presence of two scutellar spines. He did not discuss these characters in detail but the inferred states are widespread beyond the raphiocerines and are not considered support for placement in this subfamily. He compared his new genus with genera of raphiocerines that have the last antennal flagellomere aristate, and noted the absence of vein R_4 (which he called R_{2+3}) which he considered diagnostic for the genus.

We examined the holotype of *Timorimyia bidentata* Frey and found that this species should be placed in the genus *Acanthasargus*, and is extremely similar to *A. flavipes* Hardy, 1932. *Acanthasargus* is known from Australia and New Caledonia, so its presence on Timor is not particularly surprising.

Acanthasargus bidentatus (Frey, 1934), comb.n.

Timorimyia bidentata Frey, 1934: 305 (Figs 17 and 18).

Type material. The holotype ♀ [NMB] is labeled: "TYPUS [red paper]/vor Soe. Timor Dez. 1831. Handschin/*Timorimyia bidentata* n.gen, n.sp.Typ Frey det./*Acanthasargus bidentatus* Frey det. Woodley 2005". The specimen is in excellent condition except that the wings are slightly folded (Figs 17 and 18).

Figs 17–18. *Acanthasargus bidentatus* (Frey): ♀ holotype of *Timorimyia bidentata* Frey, dorsal habitus (17) and lateral view of head and thorax (18). This figure is published in colour in the online edition of this journal, that can be accessed *via* http://www.brill.nl/ise

Diagnosis. *Acanthasargus bidentatus* easily runs to *A. flavipes* in the key of James (1950: 253) that includes all described species of the genus. *Acanthasargus flavipes* is known from New South Wales and Queensland, Australia. *Acanthasargus bidentatus* differs from *A. flavipes* in having the yellow frontal spots contiguous; the yellow postocular spots larger; a small, indistinct black region at the base of the scutellum; the yellow lateral margins of the abdominal tergites not as conspicuously widened posteriorly on

segments 2–4; and tergite 5 with the posterior margin dark. The two species are otherwise extremely similar to one another, far more than either is to other members of the genus.

Genus *Odontomyia* Meigen

Odontomyia Meigen, 1803: 265. Type species, *Musca hydroleon* Linnaeus, by designation of Westwood (1840: 130).
Cyrtopus Bigot, 1883: 132. Type species, *Cyrtopus fastuosus* Bigot, by monotypy, syn.n.
Scapanocnema Enderlein 1914: 610. Type species, *Scapanocnema spathulipes* Enderlein, by original designation, syn.n.

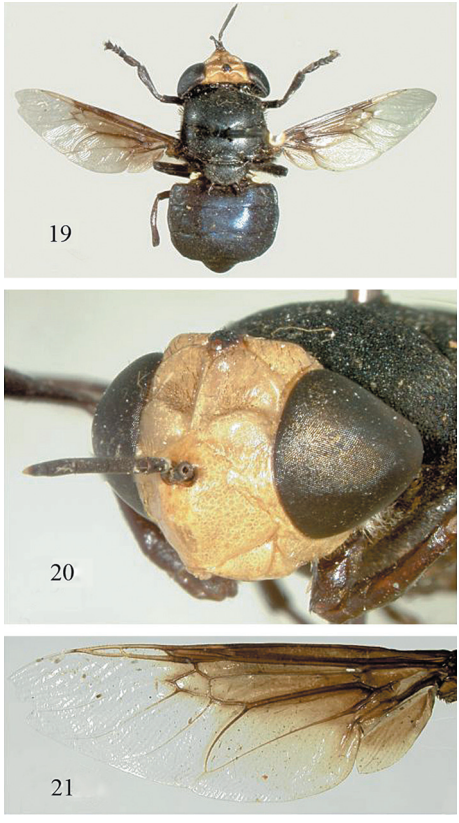
When Enderlein (1914) described *Scapanocnema*, he noted its similarity to *Odontomyia*, stating that it differed by having the apex of the front tibia widened and flattened, and by having a different frontal structure. Furthermore, he noted its similarity to *Cyrtopus* Bigot, an African genus near *Odontomyia*, which has all its tibiae similarly flattened and metallic scales on the thorax and abdomen. Based on our examination of the holotype, *S. spathulipes* is conspecific with *Odontomyia luteiceps* de Meijere, and Enderlein's generic characters are not significantly different from states found in other species of *Odontomyia*. We are, therefore, synonymizing *Scapanocnema* with *Odontomyia*.

Although Woodley (2001) recognized *Cyrtopus* as distinct following James (1980), we think it should also be relegated to synonymy under *Odontomyia*. Species previously placed in *Cyrtopus* and *Scapanocnema* have the antennal flagellum typical of *Odontomyia* with four subequal basal flagellomeres and the apical two much smaller and slightly stylate. These species also have vein M_3 greatly abbreviated or absent, also typical of *Odontomyia*. This group of species is probably a monophyletic clade within *Odontomyia*, characterized by the flattened apex of the front tibia.

Odontomyia luteiceps de Meijere (Figs 19–21)

Odontomyia luteiceps de Meijere, 1911: 267.
Scapanocnema spathulipes Enderlein, 1914: 610, syn.n.
Odontomyia latitibia Rozkošný & Kovac, 1994: 860, syn.n.

Type material. *Odontomyia luteiceps* de Meijere: De Meijere (1911) described this species based on two female specimens. We have examined the ♀ syntype from ZMAN, which we are designating as lectotype to stabilize the taxonomy of this species. It is labeled: "Borneo Exped. Dr Nieuwenhuis Mahakkam 1899 Bloe-oe/Odontomyia auriceps de Meij Type/Odontomyia luteiceps de Meijere, 1911 ZMAN type DIPT. 0918.1/LECTOTYPE ♀ Odontomyia luteiceps de Meijere, 1911 des. N. E. Woodley 2005". The specimen is in generally good condition, but is missing both antennal



Figs 19–21. *Odontomyia luteiceps* de Meijere: ♀ holotype of *Scapanocnema spathulipes* Enderlein, dorsal habitus (19), anterolateral view of head (20), and dorsal view of left wing (21). This figure is published in colour in the online edition of this journal, that can be accessed *via* http://www.brill.nl/ise

flagella, the right scutellar spine, the left middle leg beyond trochanter, and the tip of the left wing. The paralectotype ♀ from the same locality (deposited in the Nationaal Natuurhistorisch Museum, Leiden) was not examined.

Scapanocnema spathulipes Enderlein: Enderlein described this species from a single female. The holotype ♀ (PAN) is labeled: "Lombok Sapit 2000' Mai-Juni 1896 H. Fruhstorfer./Type/Scapanocnema spathulipes Type Enderl.♀ Dr. Enderlein det. 1914/ Mus. Zool. Polonicum Warszawa 12/45/Scapanocnema Enderl. 1914/spathulipes Enderl. 1914". The fifth and sixth labels are probably curatorial labels added later. The specimen is in good condition (Figs 19–21).

Odontomyia latitibia Rozkošný & Kovac: The holotype ♂, at the Naturmuseum Senckenberg, Frankfurt-am-Main, Germany, is well characterized and has been described by Rozkošný & Kovac (1994).

Diagnosis. *Odontomyia luteiceps* de Meijere is very distinctive with its dark, blackish-blue body contrasting with its yellow head (Fig. 19). There are no metallic scales on the

body. The anterior part of the wing basal to the discal cell is dark brown (Fig. 21), contrasting with the remaining hyaline wing membrane. The type specimens for synonyms of this species show very little variation, and we have seen an additional specimen from southern Aceh Province, Sumatra (USNM) that is also uniform with the types. Thus, the species is fairly widespread in the Indonesian archipelago including Malaysia and Borneo.

Odontomyia luteiceps belongs to a species group that includes three African species previously placed in *Cyrtopus* (*O. fastuosa* (Bigot), comb.n.; *O. magnifica* Lachaise & Lindner, resurrected combination, and *O. smaragdifera* (Lindner), resurrected combination), in addition to *O. luteiceps*. These species have a dark body with a contrasting yellow head, very similar female frons, and moderately large size. A specimen of a species tentatively determined as *O. cyanea* Brunetti, 1920, from Sri Lanka (USNM), also belongs to this group. It is similar in coloration, but has silvery pubescent vittae on the scutum and has the front tibia only weakly flattened, thus showing intermediate morphology between *O. luteiceps* and more typical *Odontomyia*.

Acknowledgements

Our thanks are due to the colleagues who provided material for our study: F. Ciampor and J. Kodada (via M. Kozánek, Bratislava), M. Hauser (Sacramento, CA), who mediated valuable material from the National Museum of Natural History in Leiden, H. de Jong and B. Brugge (Amsterdam), B. Merz (Geneva), Eva Sprecher (Basel) and M. Wolsan (Warsaw). F. Gregor (Brno) kindly made original colour illustrations and V. Procházková (Brno) final pen drawings of the new species. We are grateful to Martin Hauser (Department of Food and Agriculture, Plant Pest Diagnostics Branch, Sacramento, CA), Jens Prena and Allen Norrbom (both of the Systematic Entomology Lab) and Wayne Mathis (Smithsonian Institution, Washington, DC) for reviewing the manuscript. Our study was supported by the Ministry of Education of the Czech Republic, Prague, and the Masaryk University, Brno (Programme MSM 0021622416).

References

Bigot, J.M.F. (1883) Note relative à un nouveau genre de Diptères. *Bulletin des séances de la Société entomologique de France* **247**: 132–133.

Brammer, C.A. & von Dohlen, C.D. (2007). Evolutionary history of Stratiomyidae (Insecta: Diptera): The molecular phylogeny of a diverse family of flies. *Molecular Phylogenetics and Evolution* **43**: 660–673.

Brauer, F. (1882) Zweiflügler des Kaiserlichen Museums zu Wien. II. *Denkschriften der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe, Wien*, **44**: 59–110.

Brunetti, E. (1927) Notes on Malayan Diptera, with descriptions of new species. *Journal of the Federated Malay States Museums* **13**: 281–309.

de Meijere, J.C.H. (1907) Studien über südostasiatische Dipteren. I. *Tijdschrift voor Entomologie* **50**: 196–264.

de Meijere, J.C.H. (1911) Studien über südostasiatische Dipteren. VI. *Tijdschrift voor Entomologie* **54**: 258–432.

Enderlein, G. (1914) Dipterologische Studien. IX. Zur Kenntnis der Stratiomyiiden mit 3-ästiger Media und ihre Gruppierung. A. Formen, bei denen der 1. Cubitalast mit der Discoidalzelle durch Querader verbunden ist oder sie nur in einem Punkte berührt (Subfamilien: Geosarginae, Analcocerinae, Stratiomyiinae). *Zoologischer Anzeiger* **43**: 577–615.

Frey, R. (1934) Diptera brachycera von den Sunda-Inseln und Nord-Australien. *Revue Suisse de Zoologie* **41**: 299–339.

Geoffroy, E.L. (1762) *Histoire abregée des insectes qui se trouvent aux environs de Paris; dans laquelle ces animaux sont rangés suivant un ordre méthodique*. Tome Second. Durand, Paris: 690 pp.

Gerstaecker, A. (1857) Beitrag zur Kenntnis exotischer Stratiomyiden. *Linnea Entomologica* **11**: 261–350.

Hardy, G.H. (1932) Notes on Australian Stratiomyidae. *Proceedings of the Royal Society of Queensland* **44**: 41–49.

James, M.T. (1939) The species of *Euparyphus* related to *crotchii* O.S. (Diptera, Stratiomyidae). *The Pan-Pacific Entomologist* **15**: 49–56.

James, M.T. (1940) Notes on some African Stratiomyidae (Diptera) belonging to genera related to *Odontomyia*. *American Museum Novitates* **1988**: 1–3.

James, M.T. (1950) The Stratiomyidae (Diptera) of New Caledonia and the New Hebrides with notes on the Solomon Islands forms. *Journal of the Washington Academy of Sciences* **40**: 248–260.

James, M.T. (1980) Stratiomyidae. In: Crosskey, R.W. (Ed.) *Catalogue of the Diptera of the Afrotropical Region*. British Museum (Natural History), London: pp. 253–274.

Lachaise, D. & Lindner, E. (1973) Les Diptères des savannes tropicale préforestières de Lamto (Cote-d´Ivoire). I. Note écologique sur les Stratiomyidae de Lamto et description d´une espèce nouvelle: *Odontomyia magnifica*. *Annales de la Société Entomologique de France, Nouvelle Série* **9**: 593–608.

Lindner, E. (1935) Dritter Beitrag zur Kenntnis der südamerikanischen Stratiomyiidenfauna (Dipt.). *Revista de Entomologia (Rio de Janeiro)* **5**: 396–413.

Lindner, E. (1938) Aethiopische Stratiomyiiden (Dipt.) II. *Mitteilungen der Deutschen Entomologischen Gesellschaft* **8**: 66–73.

Lindner, E. (1969) Fünfter Beitrag zur Kenntnis der südamerikanischen Stratiomyiidenfauna (Dipt.). *Stuttgarter Beiträge zur Naturkunde* **203**: 1–15.

Loew, H. (1869) Diptera Americae septentrionalis indigena, Centuria octava. *Berliner Entomologische Zeitschrift* **13**: 1–52.

Meigen, J.W. (1803) Versuch eine neue Gattungseintheilung der europäischen zweiflügeligen Insekten. *Magazin für Insektenkunde* **2**: 252–281.

Osten-Sacken, C.R. (1886) Diptera [part]. In: Godman, F.D. & Salvi, O. (Eds) *Biologia Centrali Americana, or, contributions to the knowledge of the fauna and flora of Mexico and Central America. Zoologia. Class Insecta. Order Diptera. Vol. I*. London: pp. 25–48.

Papp, L. & Darvas, B. (Eds) (2000) *Contribution to a Manual of Palaearctic Diptera (with special reference to flies of economic importance). Vol. 1. General and Applied Entomology*. Science Herald, Budapest: 978 pp.

Rondani, C. (1863) *Diptera exotica revisa et annotata novis nonnullis descriptis*. Eredi Solianio, Modena, 99 pp.

Rozkošný, R. & Kovac, D. (1994) A new species of *Odontomyia* Meigen (Insecta: Diptera: Stratiomyidae) from Sabah, Borneo. *Raffles Bulletin of Zoology* **42**: 859–867.

Westwood, J.O. (Ed.) (1840) Synopsis of the genera of British insects [part]. In: *An introduction to the modern classification of insects; founded on the natural habits and corresponding organisation of the different families. Vol. II*. Longman, Orme, Brown, Green, & Longmans, London: pp. 97–158.

White, A. (1914) The Diptera – Brachycera of Tasmania. Part I. Families Leptidae, Stratiomyidae, Nemestrinidae, & Cyrtidae. *Royal Society of Tasmania*: *Papers and Proceedings* **1914**: 35–74.

Villeneuve, J. (1908) Travaux diptérologiques. *Wiener Entomologische Zeitung* **27**: 281–288.

Woodley, N.E. (2001) A world catalog of Stratiomyidae (Insecta: Diptera). *Myia* **11**: 1–475.